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(71) Applicant
Rover Group Limited

(Incorporated in the United Kingdom)

Fletchamstead Highway, Canley, Coventry, CV4 9DB,
United Kingdom

(72) Inventor
George Corbett

(74) Agent and/or Address for Service

Robert Michael Farrow
Rover Group Limited, Patent & Trade Mark
Department, Cowley Body Plant, Cowley, Oxford,
OX4 5NL, United Kingdom

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(56) Documents cited
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US 4791828 A US 4189248 A

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(54) A manual control lever and knob assembly

(57) The lever (eg a motor vehicle gear change lever) comprises a solid or hollow rod (11) having buttress ribs (19) which engage a triangular section recess (21) in the bore (17) of a resilient plastics core member (16). The core member is inserted into the blind bore (15) of an outer grip member (14) to form a knob (13). Indexing formations such as sections (12 and 18) or D-sections are provided on the end of the rod and in the core member ensure correct angular assembly of the knob onto the rod. The ribs (19) and recesses (21) may be transposed and the core member (16) may have a through bore, the indexing formation (18) being provided in the blind bore (15) of the outer grip member (14). The rod (11) and bore (17) may have grooves interlocked by a ring.

The assembly is cheap to produce and easy to assemble.

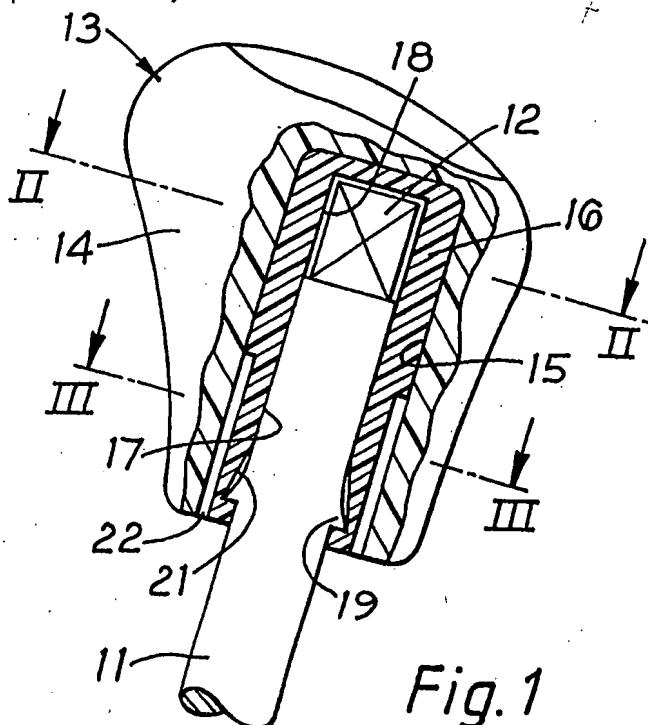
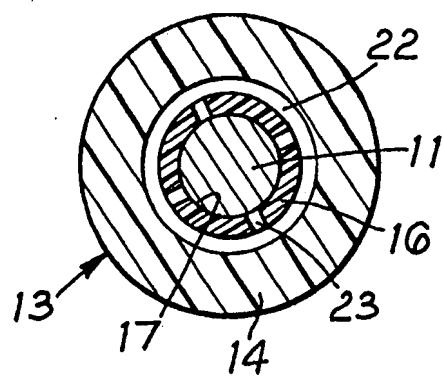
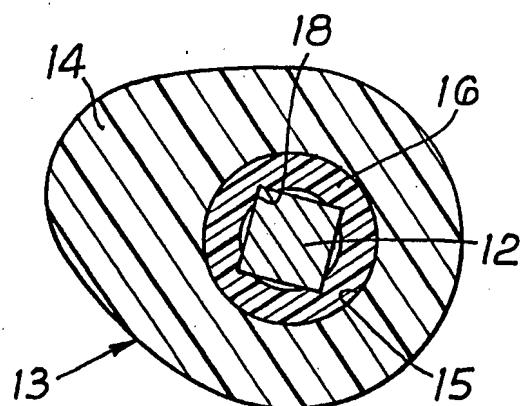
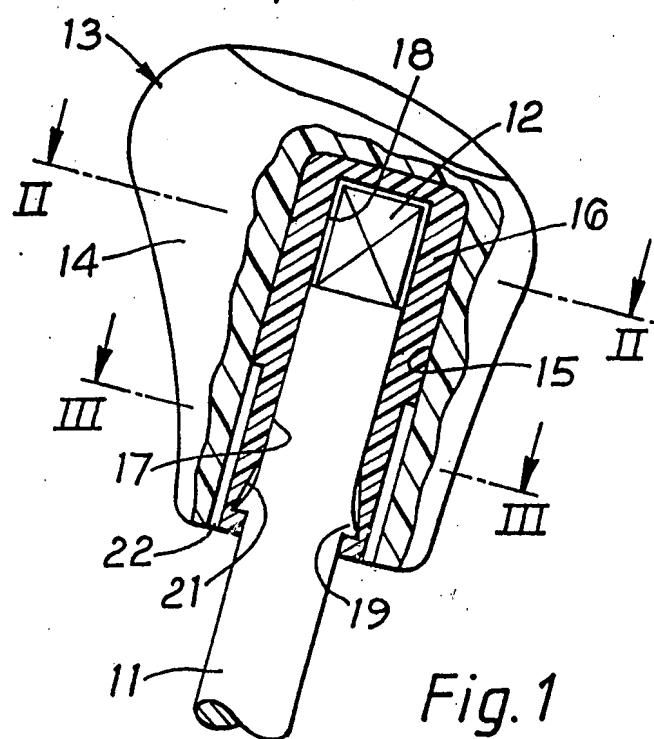


Fig. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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A CONTROL LEVER AND KNOB ASSEMBLY

The invention relates to a control lever and knob assembly. Such an assembly is used as a gear lever for a motor vehicle where it is well known to provide a screw thread on the end of the lever and screw the knob onto the end. However, such a connection is expensive and causes difficulties on an assembly line if the knob has to be positioned angularly, to display a selection gate for example. Either a lock-nut has to be used or the knob has to be tightened beyond a fully engaged position, both fitting methods requiring a fair degree of operator skill and care.

The present invention has an object an assembly of a control lever and knob which is both cheap to produce and which is easy to assembly.

According to the invention there is provided a control lever and knob assembly, the lever comprising an elongate member which is of uniform circular cross-section adjacent one end, has an indexing formation at said one end and has a latch formation axially spaced from said one end, the knob comprising an outer grip member defining a blind bore therein, a core member of resilient plastics material in the blind bore and defining a bore to receive the rod, a latch register in the bore of the core member to engage

said latch formation and an indexing register in one of said bores to engage the indexing formation.

The invention will now be described by way of example and with reference to the accompanying drawings, of which:-

Figure 1 is a part-sectioned view of a control lever and knob assembly according to the invention, showing only an end portion of the lever;

Figure 2 is a cross-section on the line II-II in Figure 1; and

Figure 3 is a cross-section on the line III in Figure 1.

The control lever and knob assembly shown in the drawings is for use as a gear lever in a motor vehicle. The lever comprises a rod 11 of uniform circular cross-section in the region of one end at which there is a square section indexing formation 12. This is forged but may be machined.

The knob 13 comprises an outer grip member 14 which defines a blind bore 15 in which there is situated a core member 16. The grip member 14 is of a soft resilient plastics, eg polyurethane, and the core member 16 is of a hard resilient plastics, eg nylon.

The core member 16 has a blind circular bore 17 of the same nominal diameter as the rod 11. At its closed end the blind bore 16 has an indexing register in the form of a square recess 18 which cooperates with an indexing formation on the rod 11 in the form of the square formation 12.

Three buttress ribs 19 on the rod 11 are spaced from the square formation 12 and act as raised latch formations. These are formed by upsetting (cold forming) and are engaged by a latch register in the form of a triangular section recess 21 in the bore 17 of the core member 16, the triangular section being shaped to accommodate the ribs 17 and present a substantially radial face to engage radial faces formed by the steep sides of the ribs.

To facilitate assembly of the knob 13 onto the rod 11, there is an annular recess 22 formed between the outer diameter of the core member 16 in the region of the triangular section recess 21 and the bore 16 in the outer grip member 14. Together with four axial slots 23 in the core member 16 which extend from the open end of bore 17 over substantially the same axial length as the annular recess 22, the annular recess allows radial expansion of the core member 16 when the knob 13 is pushed axially down the rod to enable the core member to snap over the ribs

19. The square formation 12 and square recess 18 enable the knob to be positioned angularly in the required position.

The square formation 12 and the square recess 18 need not be central to the axis of the rod 11 and the bore 17 in the core member 16, in which case, ie by providing an offset, the knob 13 can be assembled onto the rod 11 in one angular position only.

To remove the knob 13, the core member 16 can be expanded by a tool which wedges apart the sides of the slots 23. Alternatively, the ribs 19 can be made rounded or the steeper sides of the buttress less steep so that the knob can be removed by a strong axial force in the direction opposite to that applied to assemble the knob onto the rod.

Instead of being formed in the core member, the square recess may be formed in the outer grip member, the core member then having a through bore to receive the rod. Other index formations and registers may be used, for example a single flat to form a D section.

In a modification (not shown) the ribs and the triangular section recess are transposed. In a further modification (also not shown) both the rod and the bore have grooves

and a ring member provides interlocking between the grooves.

Whilst the rod is shown as solid, any other elongate member such as hollow tube may be used.

CLAIMS

1. A control lever and knob assembly, the lever comprising an elongate member which is of uniform circular cross-section adjacent one end, has an indexing formation at said one end and has a latch formation axially spaced from said one end, the knob comprising an outer grip member defining a blind bore therein, a core member of resilient plastics material in the blind bore and defining a bore to receive the rod, a latch register in the bore of the core member to engage said latch formation and an indexing register in one of said bores to engage the indexing formation.
2. An assembly according to Claim 1 wherein the indexing formation and indexing register are square.
3. An assembly according to Claim 2 wherein the square is offset from the axis of the rod.
4. An assembly according to any preceding claim wherein one of the latch formation and latch register comprises a buttress rib.
5. An assembly according to Claim 4 wherein a plurality of ribs is provided.

7. An assembly according to Claim 4 or Claim 5 wherein the other of the latch formation and latch register comprises a triangular recess to accommodate the rib or ribs.
8. An assembly according to any of Claims 1 to 3 wherein one of the latch formation and the latch register comprises a rounded rib.
9. An assembly according to any preceding claim wherein an annular recess is defined between the bore and the core member in the region of the latch formation.
10. An assembly according to any preceding claim wherein the core member has axial slots in the region of the latch formation.
11. A control lever and knob assembly substantially as described herein with reference to the accompanying drawings.

Patents Act 1977
 Examiner's report to the Comptroller under
 Section 17 (The Search Report)

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Relevant Technical fields

(i) UK CI (Edition K) B4K (KJG,KJR); F2U (U13D,
 U1354); F2Y (YCG,YSS)

(ii) Int CI (Edition 5) G05G 1/02,1/06,1/10,1/12

Search Examiner

J L Twin

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES : WPI

Date of Search

11.6.91

Documents considered relevant following a search in respect of claims

1

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 958442 (SIEMENS)	1
A, Y	GB 932762 (WILMOT BREEDEN)	1
Y	GB 895372 (GODDARD)	1
X, Y	US 4791826 (BEHRENS)	1
X, Y	US 4189248 (SULLY)	1

SF2(p)



Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).